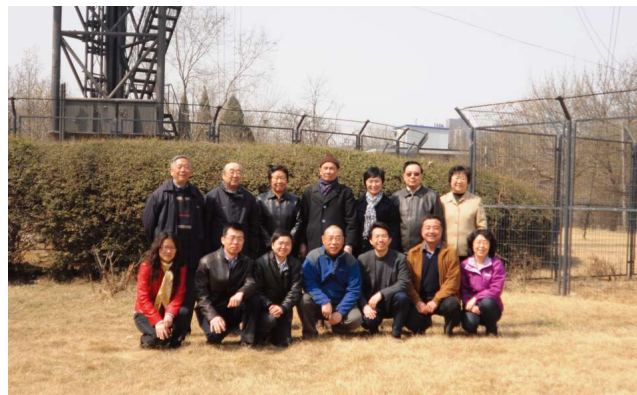# Team for Research on Formation and Development Mechanisms of Asian Dust Storm and Its Monitoring, Forecast and Disaster Assessment

In cooperation with experts from the China Meteorological Administration, the research team at the CAS Institute of Atmospheric Physics (IAP) has been focusing on soil erosion and the formation and evolution mechanisms of dust storms. Over the past ten years, the involved scientists systematically investigated the life cycle of dust storms, including the formation mechanism, long-range transport and climate effects of them, covering related issues like monitoring, forecast, and disaster assessment. A number of new findings and theoretical innovations have been achieved on issues like the dust deflation scheme, gusting winds, and atmospheric boundary layer dynamics and structure.

The team has also developed an integrated routine system for monitoring, forecast, warning and disaster assessment of the Asian dust storm, with a series of innovations in key theories and approaches. Named "Dust Storm Monitoring, Forecasting and Disaster Assessment System" (DSMFDAS), the integrated system has been widely used in various agencies in China and well recognized in both academia and society, thought to have significantly advanced the developments of science and technology on dust storm monitoring, forecast and disaster prevention.

The team for research on the formation and development mechanism of the Asian dust storm and its monitoring, forecast and disaster assessment.
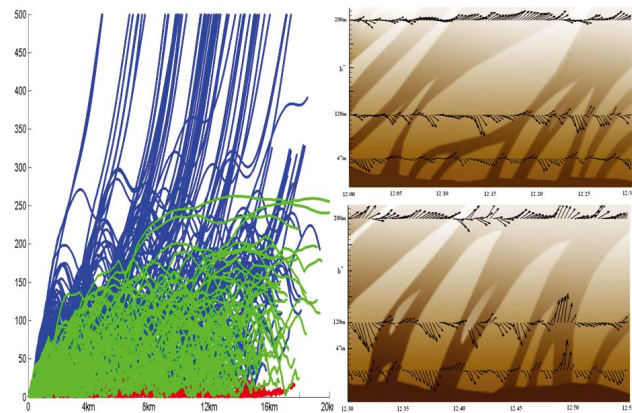

The mechanism of sand/dust emissions modeled by motions and momenta of strong winds and gustiness.

Dust Column of GEATM: 2006-04-01
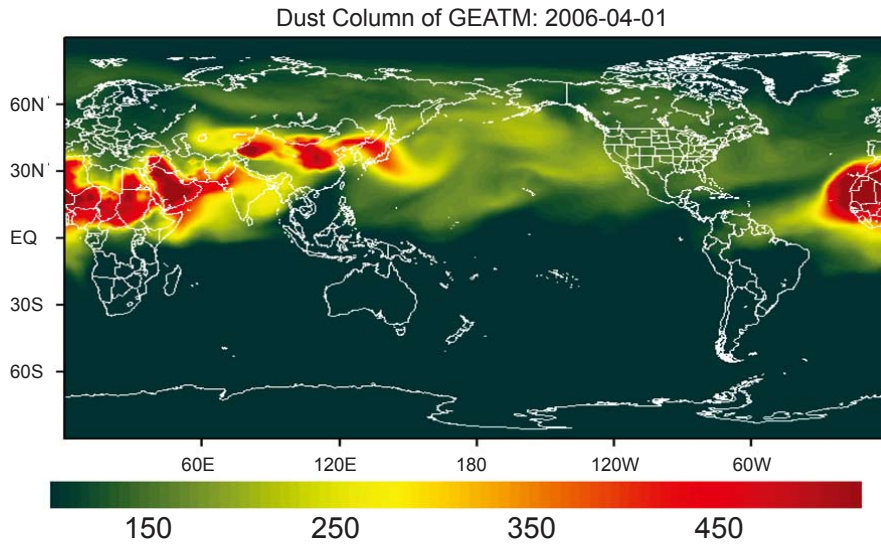
The global environmental atmospheric transport model (GEATM) developed by the team gives detailed timeline and dynamics of the sand/dust storms.

CAS Member Prof. ZENG Qingcun as the leader and organizer is responsible for the overall project design and has guided through the study, development and application of the DSMFDAS. On the other hand he has made significant contributions to revealing the formation mechanism of the life cycle of dust storms. Prof. ZHAO Sixiong, the organizer of the research plan and the key researcher, has made significant contributions to the development of the numerical integration system on dust storm weather forecast and routine applications. Prof. WANG Zifa, the key researcher, has made significant contributions to the data assimilation method and ensemble forecast, and has developed a global chemical transport and regional air quality forecast model of their own. The three leaders were awarded as prominent contributors and other 17 members of the team awarded as main participants.
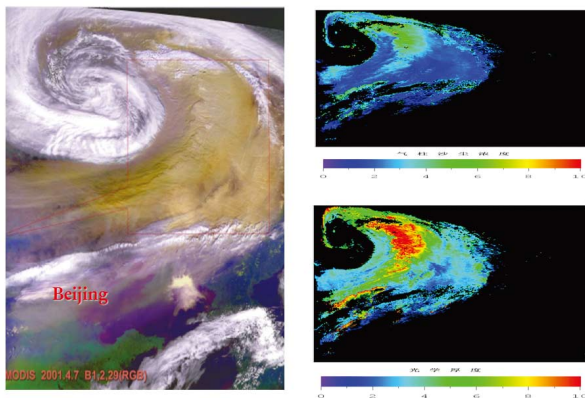
Quantitative inversion of characteristic parameters of dust storm at night based on multi-spectral information.
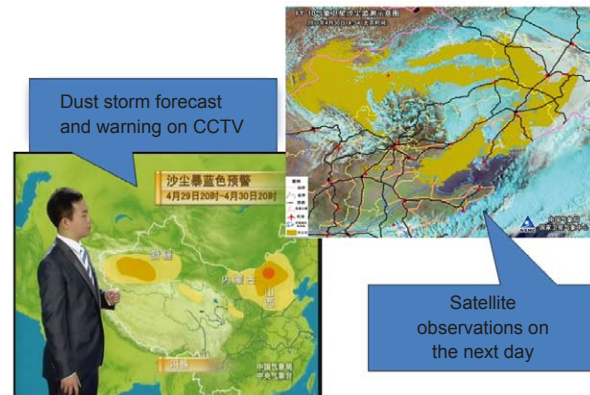
Short-term forecasting services are available to the public on CCTV, based on results from the team's research.